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A SERIES OF MOTION PICTURE DOCUMENTS ON COMMUNICATION THEORY AND THE NEW EDUCATIONAL MEDIA. FINAL REPORT.

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OHIO STATE UNIV., COLUMBUS

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A SERIES OF 40 FILMS WAS DEVELOPED FOR COLLEGE-LEVEL INSTRUCTION IN FOUR ASPECTS OF COMMUNICATION THEORY AND THE EDUCATIONAL MEDIA. THE TOPICS COVERED ARE--(1) THE INFORMATION EXPLOSION, (2) PROCESS OF COMMUNICATION, (3) PERCEPTION AND COMMUNICATION, AND (4) THE TEACHER AND TECHNOLOGY. THIS REPORT DESCRIBED THE CONCEPTS USED IN THE PRODUCTION OF THE FILM SERIES, SUGGESTED PATTERNS FOR USE OF THE SERIES, AND PROVIDED A BACKGROUND MONOGRAPH ON COMMUNICATION THEORY. THE REPORT WAS A FILM-USE MANUAL, INTENDED TO STIMULATE THINKING ABOUT HOW TO TEACH WITH MOTION PICTURES AS WELL AS HOW TO USE THE SPECIFIC FILMS IN THE IMMEDIATE SERIES. (JH)

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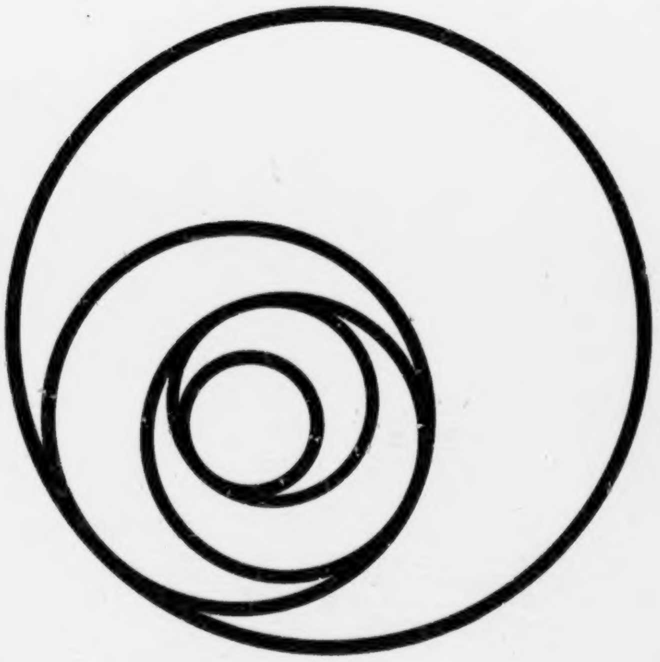

A GALAXY OF MOTION PICTURE DOCUMENTS ON COMMUNICATION THEORY AND THE NEW EDUCATIONAL MEDIA

Produced for the Department of Health, Education, and Welfare, U.S. Office of Education pursuant to contract 12-131A (EE-316-020).

Principal Investigator:
Robert W. Wagner
The Department of Photography
The Ohio State University

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December 1966

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The research reported herein was performed pursuant to a contract with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

The Ohio State University

Columbus, Ohio

CONTENTS

Page

ACKNOWLEDGEMENTS iii

INTRODUCTION 1

Part

I. A GALAXY OF FILMS. 4

II. UTILIZATION UNLIMITED. 30

III. COMMUNICATION AND EDUCATIONAL MEDIA. 62

APPENDICES 77

ACKNOWLEDGEMENTS

In addition to the participation of scores of teachers, students, school administrators, communications specialists, reserachers, and others who appear in the films in this series, and in Usage Pattern F in Part II of this report, the work of the members of the creative and technical staff behind the entire production is acknowledged for their professional and personal efforts and interest in this lengthy, difficult, complex, and often frustrating excursion into areas of unconventional film design.

These include the following members of the motion picture production staff of the Department of Photography at The Ohio State University who devoted a large part of three years in researching, writing, directing, and assembling the extensive photographic imagery represented in the Galaxy of Film Documents on Communication Theory and the New Educational Media:

Supervising Editor and Production Manager, Richard B. Long; Associate Producers Carl V. Clausen, David L. Parker, and Hubert L. Smith; Cinematographers John L. Friend and Richard L. Sherman; Film Editors John A. Werner, Thomas L. Snider, and Emory E. Meadows; Laboratory Supervisor, Margaret C. Andrews; Sound Supervisor, William R. Buccalo; Artists Thomas Crane and Kay Baughman; Business Managers, William A. Drake, Mayme Fairchild, and June James; and Secretary Judy Gill.

The continuing active participation and support of the following persons served as encouragement and ballast to the entire project:

Dr. Edgar Dale, and Dr. I. Keith Tyler, The Ohio State University; Dr. James D. Finn, the University of

Southern California; Dr. George Gerbner, Dean, the Annenberg School of Communication; Dr. Kenneth Norberg, Sacramento State University.

Robert W. Wagner
Principal Investigator

INTRODUCTION

This manual is integrated with The Ohio State University and U.S. Office of Education Project: "A Series of Motion Picture Documents on Communication Theory and the New Educational Media," produced for the Department of Health, Education and Welfare, the U.S. Office of Education, under terms of Grant B-131-A (OE-316-020).

Content

This has been designed as more than a Final Project Report to the funding agency and goes farther than the usual Film Utilization Manual. Rather, it is intended as a springboard for broad thinking about how to teach with the motion picture as well as how to teach with the specific films at hand. It is, like the films themselves, suffused with suggestibility and provocative considerations about the whole field of communication, instructional technology, theories of perception, teaching, and learning. Basically, both the films and this report are, as indeed they must be, about the problems of education, and document some of the ways in which these problems are being attacked in our time.

Part I of this Manual describes the "Galaxy of Films" concept developed in the production of the "Series of Motion Picture Documents on Communication Theory and the New Educational Media."

Part II suggests patterns of use, some of which have been tested, and includes examples of how the utilization of motion pictures designed in this manner may be practically unlimited.

Part III is a background monograph on communication theory written by Dr. Harbans Singh Bhola who was invited to observe and react freely to the latter stages of production and staff discussions involving the theory of the project. He was selected because of his perceptivity, his experience in the field of communication and education, and because, coming from a different culture, he could add new and fresh dimensions to the thinking about the problems of educational communication and instructional technology in the United States.

Dr. Bhola, who is presently Head, Department of Training, Literary House, Singar Nagar, Lucknow, India, contributed significantly to the writing of Parts I and II of this Manual. The monograph which comprises Part III is entirely his own.

Intended Users

Both the films and this Manual are designed with the user in mind. They are addressed primarily to instructors in teachers' colleges, audiovisual specialists, and those in media institutes or seminars who teach courses in communication theory, educational media, curriculum, film, radio, television, or programmed instruction--teachers who stand between the producers of communication research and theory on the one hand, and consumers of this research on the other. The primary consideration is to provide a flexible, useful, rich, and provocative repertory of materials for use by those who discharge the important responsibility of interpreting and articulating theory and experimental research in communication, learning theory, perception, and instructional technology.

A second group of users is envisioned as consisting of teachers of college courses in sociology; journalism; psychology; public opinion; business and personnel management; school administration; and other subject areas which require communication insight. This would include instructors in industry and government responsible for workshops and training courses in communication and information dissemination; for public relations personnel; military trainees; or for those preparing to work in inter-community or inter-cultural programs such as the Peace Corps, Headstart, and others.

Intended Viewers

The intended viewers of the films are, specifically, students in teachers' colleges and universities; public school teachers in service; college students in sociology, psychology, public opinion, speech, radio, television, film, communication theory; media producers, directors, and writers; educational administrators; trainees in military and industry programs; participants in media institutes, seminars, and workshops; librarians; and media specialists in training.

The Galaxy of Films concept, described later, has been found to be of particular value in existing university courses identified under the general heading of: "Audio Visual Education," or "Instructional Technology," and in Media Institutes such as those funded by the Department of Health, Education and Welfare. Finally, the material is so designed that it may be used not only in 16mm classroom form, but also reduced to 8mm segments for specialized and selective viewing, or translated to television for wide, non-specialized public service programming as adul edu-cation.

Robert W. Wagner
Principal Investigator

PART I

A GALAXY OF FILMS
(Method)

The Rationale for the Project

What do teachers really need to know about communication theory, perception, instructional technology? What is the so-called "communications revolution?" What is meant by "the information explosion?" Answers to these questions are not hard to find. For a teacher who regards himself as a serious professional and who wants satisfaction from, and security in the job he is doing, the need to cope with these new concepts and new tools is real and urgent.

The application of technology to education has probably been the single most important response made in the present decade to the threefold problem of expanded enrollments, the dramatic increase in the volume of human knowledge, and the accent on excellence in education. This, in recent years, has resulted in a variety of kits of integrated materials, packaged teaching aids, instructional resource centers, and the more sophisticated instructional systems being made available to schools. The fears that teachers sometimes seem to have of losing control of, and responsibility for, their pupils in the classroom to a faceless, de-personalized instructional systems-packager might very well be fulfilled if the teacher does not understand the kits and systems of programmed instruction appearing in larger and larger "packages." Only through a better knowledge of communication theory, the psychology of perception and instructional technology, will teachers learn to design satisfying individual and group experiences for learners; be able to define and expand their own role with respect to the packager, the instructional system and the learners; become competent in applying their art to the science and technology of teaching by relating and articulating new educational media, and instructional systems with the needs of individual learners in their own classrooms.

The Galaxy Idea

The films produced in this project themselves form a filmed instructional program, of which the present Manual is designed as an integrated and organized supportive and explanatory part.

The films are intended to be used to help the instructor teach one or more units on communication theory, educational technology, perception, and the new educational media in advanced undergraduate and beginning graduate courses at the college level. When "unpackaged," or reorganized, this same basic material may be used in advanced graduate seminars in communication, media, and speech arts, and other areas of general education.

Using a Space-Age analogy, the various films are viewed as forming a Galaxy of motion picture documents. At the heart of the Galaxy are four "Planetary Films"--The Information Explosion, Perception and Communication, The Process of Communication, and The Teacher and Technology. Each Planetary Film is composed of a number of different sequences designed to be used separately. These are designated as "Asteroid Films."

Figure I shows the sequential design for the Planetary Films, identifying the various Asteroid segments within each Planetary Film.

The major films, and the concepts and themes discussed in the Planetary films, and the Asteroid sequences of which they are composed, are supplemented by five "Satellite Films," produced as spin-off material in the course of the main production. These useful, in-depth films are titled: The Communication Revolution; Communications Conference; Teaching Machines and Sidney Pressey; Music Research; and Teacher-Centered Television.

The Planetary films--and this Manual--move from the simple to the complex; from the more concrete to the more abstract. The structure of each of these films, therefore, is more than a sequence of single-concept films or conventional filmic episodes. Each is not only related to others in the film by a single, unifying theme, but also repeats, extends, and sophisticates the ideas contained in the previous segment. Each is, at the same time, designed to be used as a self-contained filmic message with a simple technique

FIGURE I. DESIGN OF PLANETARY FILMS BY ASTEROIDS

THE INFORMATION EXPLOSION
(Code: Info Expl)

- Communication Revolution (INFO EXPL 1)
- Information Storage, Retrieval, Control (INFO EXPL 2)
- Communication in Government (INFO EXPL 3)
- Communication in Industry (INFO EXPL 4)
- Communication in the Professions (INFO EXPL 5)
- Media and Children (INFO EXPL 6)

PROCESS OF COMMUNICATION
(Code: Proces Com)

- A Model of Communication (PROCES COM 1)
- Theory of Communication (PROCES COM 2)
- Industry Model (PROCES COM 3)
- Military Model (PROCES COM 4)
- Administration Model (PROCES COM 5)
- Teacher Training Model (PROCES COM 6)
- Computer Model (PROCES COM 7)
- The Teacher as a Model of Communication (PROCES COM 8)

PERCEPTION & COMMUNICATION
(Code: Perception)

- Sensory Learning (PERCEPTION 1)
- Theories of Perception (PERCEPTION 2)
- Perception Training (PERCEPTION 3)
- Intercultural Perception (PERCEPTION 4)
- Perception & Deprivation (PERCEPTION 5)
- Perception & Education (PERCEPTION 6)

THE TEACHER & TECHNOLOGY
(Code: Teach Tech)

- Learning as Self Learning (TEACH TECH 1)
- History of Instructional Technology (TEACH TECH 2)
- Media & the Military (TEACH TECH 3)
- Media & the Humanities (TEACH TECH 4)
- Media & the Continuous Progress School (TEACH TECH 5)
- The Computerized School (TEACH TECH 6)
- Media & the Curriculum (TEACH TECH 7)
- Media & the Masses (TEACH TECH 8)
- The Instructional Resource Center (TEACH TECH 9)
- The School of Tomorrow (TEACH TECH 10)
- The Teacher of Tomorrow (TEACH TECH 11)

for detaching and using it separately, as well as for replacing it in the original sequence. This technique will be described in Part II.

Description of Planetary and Asteroid Films

The four Planetary Films are composed of a total of thirty-one Asteroid Films described below. The code symbols, used for simplified identification, appear in later references in this Manual, and are also printed on the edge of the films themselves to expedite utilization as described in Part II.

THE INFORMATION EXPLOSION (B&W with color segment. Time: 34:20).

This film suggests the spirit of the revolution in communication that has made it possible for any information, verbal and pictorial, to be stored, duplicated, transferred or transformed, distributed, and received over distances and with speeds unimagined by the human mind a few decades ago. It is concerned with how this flood of information may be responsibly processed, and with the effects of it all on the lives of children. It is composed of six Asteroid segments:

Communication Revolution (Code: "Infor-Expl-1"). Color-B&W. Time: 7:06.

A montage of scenes showing the variety of messages and media that constantly assault the senses of the man-in-the-street--messages from radio, advertising, film, newspapers, signal devices--and from other people. The basic emotion is confusion. The basic question is, "How does anyone make sense out of all this?"

Dr. Edgar Dale, in the setting of a bookstore filled with paperbacks, addresses the viewer directly, asking key questions about the nature of the revolution in human communications, and its origin. The scene shifts to Stanford University where Dr. Wilbur Schramm is seen talking to a group of students. As Schramm's voice comes in over the picture, he outlines the background to communication history over an animated sequence depicting man's attempts to communicate from cave paintings through the printing press, to the recent electronic revolution.

Information Storage, Retrieval, and Control (Code: "Infor-Expl-2"). B&W. Time: 1:16.

Edgar Dale returns to the screen, calling attention to the tremendous explosion of knowledge resulting from the sophistication and proliferation of message-generating media and systems of media. The problem of bringing this flood under control is mentioned and examples of how it is being organized in print, film, by computer, and by other methods are suggested.

Communication in Government (Code: "Infor-Expl-3"). B&W. Time: 2:03.

This segment is taken from a televised Presidential press conference held by John Kennedy. It briefly, but effectively illuminates the importance of keeping a free exchange of information between nations; the necessity of a constant dialog possible through the international media of communication. It also raises questions of news management and national security.

Communication in Industry (Code: "Infor-Expl-4"). B&W. Time: 6:28.

A leading airline company uses telephone conference lines and rapid transmission and retrieval systems for both audio and visual information to keep its top executives informed on current company business throughout the nation. An "executive briefing session" is pictured in which two-way communication through a variety of media, is established and information on all phases of this airlines operation is analyzed on a daily basis.

Communication in the Professions (Code: "Infor-Expl-5"). B&W. Time: 6:21.

The Ohio Medical radio network, through FM, presents new medical information to busy doctors and medical students. Two-way hookups permit live discussion between students at medical centers and leading medical experts, such as Dr. Albert Sabin, pictured in this segment, whose message originates at a distance and yet reaches a scattered, yet crucial audience throughout a wide area. The unique potential of radio (supplemented by other media) is pointed up as a way of bringing the explosion of information under control in the expanding and critical area of medical knowledge.

Media and Children (Code: "Infor-Expl-6"). B&W. Time: 11:04.

Edgar Dale introduces the final Asteroid segment which emphasizes the necessity for teachers to know much more than they do about the influences of media experiences on children outside their school hours. An elementary school boy and a high school girl, in short case studies, relate some of their listening, reading, and viewing habits. The influence of teachers and parents is strongly suggested. Dale concludes by pointing out that teachers need to be concerned and aware of media influences on children, a view supported by Gilbert Seldes, Marshall McLuhan, and I. Keith Tyler who comment briefly on the need for developing, in the very young, a race of critics.

THE PROCESS OF COMMUNICATION (B&W with color segment. Time: 45:33).

This film explores the process of communication beginning with an animated theoretical model, followed by Asteroid sequences which progressively elaborate and illuminate the theory through illustrations drawn from communications networks in military, industrial, research, and teaching settings. It is composed of eight Asteroid sequences:

A Model of Communication (Code: "Proces-Com-1"). Color. Time: 4:05.

An animated kaleidoscopic deluge of neutral and then sharply emotional symbols represent the bewildering array of stimuli from which we select and upon which we must act. A simple communications model is constructed from the key elements--sender, receiver, message, medium, feedback, noise. Communication, in this context, is described as purposeful messages limited to those formulated and sent with intent to produce some kind of effect on the thought or action of the receiver. Some of the difficulties in the process are suggested.

Theory of Communication (Code: "Proces-Com-2"). B&W. Time: 4:40.

Dr. George C Gerbner, Dean of the Annenberg School of Communication adds philosophical depth to the foregoing model of communication. His concern is with the total process, with the importance of feedback, and control of the communication situation, thus preparing the viewer for thoughtful analysis of the sequences to come.

Industrial Model (Code: "Proces-Com-3"). B&W. Time: 2:35.

The training of hostesses at the United Airlines educational center in Chicago is the setting for this application of the communications model to skills training. Here, message content is largely fixed, objectives are clear, presentation is concrete, varied, and direct, and feedback is tolerated but not essential. The situation is seen as one of quantitative transfer of information in a linear manner common to many, and perhaps most, skills training situations in education.

Military Model (Code: "Proces-Com-4"). B&W. Time: 4:33.

In the program for advanced career officers at the Command and General Staff College at Fort Levenworth, Kansas, objectives are fixed and clear messages are prepared by expert designers, delivered by experts in presentation using a multiple-media approach. Sound tactical answers must be arrived at, but a high order of decision-making is also involved requiring more complex communication networks and feedback systems than in simple skills training. In this Asteroid, a very complete system of messages is seen transmitted with high efficiency in a carefully simulated situation that demands positive feedback within well-defined limits.

Education Administration Model (Code: "Proces-Com-5"). B&W. Time: 6:46.

In another highly organized simulated environment, educational administrators are seen at The Ohio State University in a workshop of the University Council on Educational Administration. Here, through films, tapes, filmstrips, written and spoken messages, educational and administrative decisions must be made on sometimes ambiguous and incomplete information. The objectives are less clearly defined than in a skills training or military program, and the answers are, therefore, generally more complex. Feedback, in the form of human interaction and dialogue, is an essential, and perhaps the most important element of this model.

Teacher Training Model (Code: "Proces-Com-6"). B&W. Time: 6:20.

The process of communication carried over into a sophisticated simulation situation is shown in the system developed for teacher training by Bert Kersh at the University of Oregon's College of Education in Monmouth. Here, students receive in-depth orientation to a mythical "Mr. Land's Sixth Grade" classroom which they will be required to take over. Through case histories of each student, slides on the background of the school and the class, and other records of the community, the teachers in training gain understandings of the environment. Each faces an 8mm rear screen projector as Mr. Land turns the class over to him. Each then must cope with a series of specially filmed situations presented on a life-size rear projector screen with controls supervised by the instructor to produce immediate and realistic feedback.

Computer Models (Code: "Proces-Com-7"). B&W. Time: 13:20.

Two computer-based teaching-learning systems at the University of Illinois are seen in operation as mechanically and electronically complete models of the total communication process. All the basic elements of a human teacher-student information processing system are present. The built-in perceptual memories and feedback functions are unique features in the PLATO and SOCRATES systems shown and explained by Dr. Lawrence Stolurow and Dr. Donald Bitzer, developers of these respective systems. Implications for the teacher and the learner conclude this Asteroid segment.

The Teacher as a Model of Communication (Code: "Proces-Com-8"). B&W. Time: 3:13.

Dr. George Gerbner ties together the major elements and some of the key issues in the process of communication. The emphasis is on the function of the professional teacher and his responsibility and role in the process. This Asteroid, and the Planetary film of which it a part, concludes with a statement by a thoughtful high-school teacher who sees his role as one of helping sutdents discover, explore, and build their own meaningful relations in a world of increasing, multiple-imaged stimuli.

PERCEPTION AND COMMUNICATION (B&W with color segment. Time: 32:00).

This Planetary film is a series of concrete examples of how human perceptions affect the communication process and the individual's concept of reality. Two major theories of perception--the cognitive and the transactional--are introduced, each being illustrated to varying degrees in the six Asteroid films of which this Planetary film is composed:

Sensory Learning (Code: "Perception-1"). Color-B&W. Time: 3:28.

An opening montage of pre-school children exploring their environment reminds us of the importance of the senses in the learning process. At an outdoor art show in an elementary school we see a variety of interpretive paintings of a cat, suggesting that although the child's perceptions vary widely in the first years of life, they tend to become somewhat conventionalized by the time they reach sixth grade.

At a summer camp for blind children we note how other senses are used to compensate for the loss of sight and that often these senses remain undeveloped in "normal" children through lack of use. Finally, as learning moves from the level of the concrete to the abstract, the difficulty of testing accuracy of perception by sensory means alone is increased.

Theories of Perception (Code: "Perception-2"). B&W. Time: 5:23.

Dr. Kenneth Norberg of Sacramento State College defines the relation of perception to education, and introduces the fact that there are many theories of perception. One of these, he explains, is the cognitive theory, one of the exponents of which is Dr.

James Gibson of Cornell University. In a short section we hear a fragment of Dr. Gibson's theory. In the same way, Norberg introduces Dr. Hadley Cantril who is heard in a brief excerpt on transactional theory of perception. Norberg finally relates some of these theories to applications in industry training programs, intercultural programs, and programs for the culturally deprived.

Perception Training (Code: Perception-3"). B&W. Time: 5:30.

The thesis here is the importance of perceptions of the perceptions of other human beings, and documentation of the fact that one can learn to improve his ability to be perceptive and to improve, thereby, his communication skills. Airlines education director, W. Phil Herriott explains a program on which the company spent four years to fill a gap in the training of customer service agents. Using films, programmed text, tapes, role-playing, and discussion, customer service agents are shown in various instructional settings. Herriott states that this course in "perceptive action" has been successful, that perceptual skills can be sharpened and trained, and that specially prepared media and materials of instruction play a critical part in the training program.

Intercultural Perception (Code: "Perception-4"). B&W. Time: 4:55.

At a gathering of university foreign students, one of the first Peace Corps volunteers relates her experiences in teaching agriculture in Sarawak. We are reminded that whatever the situation, teachers and students face the problem of reaching common understandings. It is easier to see the problem of perception in a foreign culture where the barriers are most obvious, but the application to all educational situations should be clear. As in the airlines training program Asteroid which precedes this one, it is seen that perceptions can be sharpened and behavior made more perceptive through a training program involving films, simulation, and other materials along with thoughtful evaluation of the rich, concrete experiences found in the working situation itself.

Perception and Deprived Children (Code: "Perception-5"). B&W. Time: 9:45.

It is often more difficult to see the barriers to communication operating in sub-culture within our own culture than in the case of the intercultural perceptions found in the previous Asteroid. In this one, we see a group of five-year olds on a school playground who look and seem no different from others of their same age group. Actually, they are "Headstart" children whose special, limited perceptions are seen by a visit to one of their homes and by the stories told by Headstart teachers in a discussion of how to develop "perceptual skills" in their students. The first-hand observations of these teachers, their active exploration of barriers with children who have never seen a peach before, or celebrated a birthday, or seen a photograph of themselves, or visited a farm, are the backbone of this documentary report. In the course of this exploration, as in the two previous Asteroids, we are reminded that the skill of perceiving may be learned by both teachers and students. We must never take the background of any student for granted; and any and all media must be used, along with concrete experiences, to develop common, basic concepts of the world around us.

Perception and Education (Code: "Perception-6"). B&W. Time: 2:43.

Dr. Kenneth Norberg appears in this final Asteroid to pull together some of the key relationships of perception to the educational environment. Exploring subject matter through different media, different experiences, different points of view, is the best insurance for accuracy of perception. The teacher must be trained to be more perceptive of himself and must learn to help students not only develop common perceptions, but also the ability to perceive differently and creatively through multi-sensory experiences of all types.

THE TEACHER AND TECHNOLOGY (B&W. Time: 49:10).

The beginnings and history of the impact of technology on education is traced in the opening sequences of this film, followed by a series of pictorially documented programs which illustrate some of the ways in which technology is being used to meet the dual problem of masses of students and the need for individual instruction. Throughout, the implications for the role of the student, teachers, and school administrator are suggested, and the film ends with Asteroids on how the school and the teacher of tomorrow might look based on working prototypes found in programs existent today. The total film is composed of eleven Asteroids:

Learning As Self-Learning (Code: "Teach-Tech-1"). B&W. Time: 2:28.

In a montage of young people in self-instructional, media-centered experiences including models, tapes, oscilloscopes, computers, teaching machines, exhibits, and other technological developments, the point implied is that, after all, all learning is self-learning and that while Johnny must still learn to read, the fact is that the Second Industrial Revolution has caught up with education. Instructional Technology is here to stay.

The History of Instructional Technology (Code: "Teach-Tech-2"). B&W. Time: 4:06.

Dr. James D. Finn, of the University of Southern

California defines "instructional Technology," and outlines the major phases in its historic development. It is pointed out that technology is more than a matter of materials and hardware. It involves a way of organizing instructional resources and the interaction of science, art, and human values. It implies effects upon curriculum, school architecture, the role of the student, teacher, and administrator, and these effects are crucial in a time when we must learn or perish.

Media and the Military (Code: "Teach-Tech-3"). B&W. Time: 4:46.

The Air Force Academy in Colorado Springs is used as an example of highly organized media use through the centralized services and facilities of an Audiovisual Center under the supervision of a Media Specialist. Major H. B. Hitchens, Director of this Center explains the facilities, featuring the unique concept of "teacher-centered television" CCTV. Implied is the role of the audiovisual specialist; centralization of materials and equipment; teacher control of a multi-media teaching-learning system in which the teacher is described as a "manager of instructional resources."

Media and the Humanities (Code: "Teach-Tech-4"). B&W. Time: 5:05.

At Stephens College, in Columbia, Missouri, Professor Charles Madden, Chairman of the Communications Department, is seen using an amplified telephone to bring into his class and to other colleges in this communications network, the voices of authors John Dos Passos, Vance Bourjoily, and Ralph Ellison. The point is made that technology, far from dehumanizing education, may be essential if we are to bring vital and otherwise inaccessible experiences to the classroom. The use of other simple aids--the 2x2 projector, and the chalkboard--is seen in the course of the presentation. Direct feedback from student to author is provided in this telephone dialogue, with the teacher still serving an indispensable function. The final point in this Asteroid is that the teacher, through technology, now has resources that give him direct access to more knowledge than Renaissance man ever dreamed of.

Media and the Continuous Progress School (Code: "Teach-Tech-5"). B&W. Time: 9:23.

The Brigham Young Laboratory School, in Provo, Utah, is viewed as an example of a growing number of programs based on individualized instruction, independent study, and the use of both programmed and non-programmed materials. The breakdown of learning activities into independent study, small group, and large group instruction, individual testing, and counseling is seen. Lowell Thomson, Director of the Laboratory School, describes the program with comments by several teachers.

The Computerized School (Code: "Teach-Tech-6"). B&W. Time: 2:56.

While the computer, as part of the arsenal of technological tools in education, will doubtless have much wider application in the future, it is used in the John Marshall High School in Portland, Oregon, to generate the logistics for a complex class schedule. The effect of the computer, far from mechanizing the routine of this school, has liberated students and teachers and made possible a flexibility in the schedules of both not possible without computer feedback. The result, according to Principal Gaynor Petrequin, was "to vitalize learning and teaching by individualizing instruction." The work of the library, departmental resource centers, the school audiovisual center, and the open lab is suggested.

Media and the Curriculum (Code: "Teach-Tech-7"). B&W. Time: 6:36.

The Valley Winds Elementary School in St. Louis, Missouri, is the setting for this brief look into how curriculum,school design, and media and materials of instruction relate in a technological age. The core or this segment is a discussion by the curriculum committee. In this school, instructional materials are an integral part of the experience of both teachers and students. The teacher is not viewed as the sole repository of knowledge, nor as a technician carrying out decisions which have been programmed. Technology is used to help individualize the teaching-learning situation which includes a wide array and variety of accessible materials. The teacher is a transactional agent--planning and prescribing learning experiences from this array.

Media and the Masses (Code: "Teach-Tech-8"). B&W. Time: 5:11.

The use of technology to meet the learning needs of masses of students is seen the The Ohio State University's dial-access system. Nearly 100 courses are presented through an audio-tape facility to which students have direct dial-access from the carrels in the student union building, the main library, and from dormitories on and off the campus. In this extension of the language laboratory idea, is found a possible prototype for individualizing study and bringing homework and classwork closer together in the growing university population. More than 80,000 calls a week, or more than 10,000 student requests daily may be handled by this use of technology in education.

The Instructional Resources Center (Code: "Teach-Tech-9"). B&W. Time: 1:58.

The Instructional Resources Center at the University of Miami is briefly described in this Asteroid which is related to the preceding sequence on how technology is being used to meet the needs of an increased population at The Ohio State University. It is also the linkage sequence to the school of tomorrow Asteroid which follows, suggesting the development of learning centers equipped with both classrooms and studios based on a media-centered design.

The School of Tomorrow (Code: "Teach-Tech-10"). B&W. Time: 3:35.

This Asteroid poses a series of questions: What will be the shape of the school of tomorrow? How will it meet the educational needs of our time? How will the technological potential of this century be applied to advance educational objectives? Visually, it is a composite drawn from situations seen in previous Asteroids. The attempt is not to portray a composite of the school of tomorrow, but rather to collect elements which exist today and which may, in one form or another, appear in the schools of the future.

The Teacher of Tomorrow (Code: "Teach-Tech-11"). B&W. Time: 3:02.

The final Asteroid of this Planetary film is a capsulation of the major theme: "The Teacher and Technology". It begins with a statement by James Finn to the effect that while obvious hazards to human values are introduced by any technological development, technology should not make education less humane unless the teacher fails in his role. Put positively, technology may be the means by which the teacher will come, at last, to play a new, more critical and more excitingly professional role than ever before in the history of education. A succession of shots, taken from previous segments of the film, suggest that some teachers are already beginning to find their professional place in the increasingly technological society of which we are all a part.

Description of Satellite Films

The Galaxy of Films includes five "Satellite Films" conceived as in-depth material supplementary to the programmed Planetary and Asteroid films. The Satellites, unlike the Planetary films, do not lead viewers step by step but, rather, point directions and invite viewers to discover ideas for themselves.

They are "spin off" materials, produced in the course of collecting documentary evidence for the Planetary films. But in themselves they contain insights of major interest which, it was felt, should be preserved for study. For serious students of communication they will also provide perhaps increasingly useful historical material.

COMMUNICATION CONFERENCE (Code: "S-1"). B&W. Time: 30:50.

This film brings together six of the nation's foremost thinkers, teachers, practitioners and innovators of social communications in an informal conference. Those appearing in the film are Edgar Dale, James Finn, George Gerbner, Charles Hoban, Franklin Knower and Kenneth Norberg. This putting together of heads results in illuminating insights on the nature of communication, and how it differs from other social interactions; the social implications of a widespread communication network in most modern societies; the inadequacy of language as a vehicle of communication, and the unintended and expressive meanings of messages that must accompany intended communications; the nature and educational implications of packaged instructional systems; and the teacher's new role in the classroom at the learner's elbow with important decision-making responsibilities in the selection and arrangement of instructional materials and systems.

The most important feature of the film is its informality. No answers are supplied, but each idea is thought through and expressed with feeling and professional conviction. The discussion which is open-ended should be continued in the classroom as a confrontation of ideas between film viewers on questions like: What is the nature of communication? How does communication differ from other kinds of social interaction? What is intrinsic in language that makes it an inadequate vehicle of communication? Can we ever communicate with perfection? What are instructional systems and how do they affect the teacher's role?

THE COMMUNICATION REVOLUTION (Code: "S-2"). B&W. Time: 21:35.

The Communication Revolution presents Edgar Dale, Marshall McLuhan, Gilbert Seldes, and I. Keith Tyler in a discussion of the impact of newer communications media on Western civilization.

The questions raised are philosophical. What kind of a world was the world of print? Did the printed word force a linearity of thought; a more powerful logical structuring of reality? Did the print medium foster intellectualism and individualism? Was the printed word really the undoing of the Feudal System in Europe?

Similar questions are raised about the new electronic media. What is the nature of the new media? Are they a new "staple" to which modern economic and social systems must adjust? Do these media, through a more inclusive, deeply sensuous commitment create "involved but unthinking" people? Is the "all-at-onceness" of the new media (as distinguished from the line-by-line exposure in written material) really affecting our ways of structuring reality?

McLuhan talks of "cool" and "hot" media, of a global culture being made possible by radio, of the new distribution of power through a new distribution of information ond of the inevitable need of teaching media discrimination in schools and colleges. Seldes calls for "a race of critics."

These and other provocative questions are raised, and insightful points of view are provided which should provide a springboard for discussion.

TEACHER-CENTERED TELEVISION (Code: "S-3"). B&W. Time: 22:24.

This kinescope, made from an original video tape produced by the United States Air Force Academy at Colorado Springs for in-service training of instructors at the Academy and included in the Galaxy of Films by special arrangement, describes the unique closed-circuit television system developed at the Academy.

The system is designed to be maximally responsive to teacher designed message generation by providing the instructor with a multiple-media presentation system which is largely under his personal control. Available to the instructor is a range of resources in flexible combinations of four television options--films, video tapes, library materials, and live demonstration.

In a special studio, the television teacher, working from a desk-console, can switch cameras, control audio and video, bring in film clips or graphics, present demonstrations zooming in on details, thus controlling the substance, sequence, and input of his television presentation which is then put on video tape. This teacher-centered television system with maximum instructor control, and responsive to learner feedback has obvious implications for television use in public school systems.

The film addresses itself to such basic questions as: What is the role of TV in an instructional or a training program? How does a particular instructional philosophy determine the type of television facilities developed in a school or a training institute? What kinds of visual resources may be drawn together in "multiple-option, teacher-centered television?"

TEACHING MACHINES AND SIDNEY PRESSEY (Code: "S-4"). B&W. Time: 11:45.

This is a portrait of Sidney Pressey, Emeritus Professor of Psychology at The Ohio State University who presents the historic teaching machine he invented in 1925 as a self-teaching, self-testing device.

The film relates that the U.S. Navy made use of one of Pressey's early models in Naval training shortly after the Second World War but the time was not ripe. The American education was not ready for this innovation. The concept of the teaching machine was refined by B. F. Skinner more than thirty years later. The teaching machine became more versatile, much more elaborately related to learning theory, and it presented instructional content that had been more carefully programmed.

Pressey reflects on those earliest models of teaching machines and feedback devices like the punchboard and the chemo-card. He points out that the uniqueness of the teaching machine is that it requires participation through active response, offers rewards to learners, and makes available to the teacher the learner's profile of learning experience.

The film ends by historically relating Pressey's work to that of Skinner and Norman Crowder pointing out that the teaching machine might be the best teaching aid teachers ever had.

The film should stimulate discussion of basic questions such as: What is the role of the teaching machine and the teacher? What is the relationship between the teaching machine and the learner? What is the relationship of the machine (hardware) and the program (logical or psychological structuring of instruction)? What is the significance of teaching machine development in light of its present status in education?

MUSIC RESEARCH (Code: "S-5"). B&W. Time: 16:55. This film was produced by The Ohio State University for The Music Educators Conference of the N.E.A. under contract with the U.S. Office of Education. It should serve at least two instructional objectives: (1) to suggest to music teachers interesting possibilities in teaching music skills and analyzing musicality; and (2) to provide students of educational technology with an exciting application of programmed instruction to the teaching of non-verbal, creative skills. It is also an interesting example of a "research report on celluloid." It is composed of two parts, designed after the Asteroid concept, so each may be used separately.

In Part I (Time: 6:55) subtitled Self Teaching of Music Fundamentals, we visit Dr. Charles Spohn's Audio-Visual Music Laboratory at The Ohio State University which is equipped to handle individualized instruction through programmed tapes and materials. Students are shown using a variety of presentation and feedback devices such as the Conn Dynalevel, the Conn Strobotuner, and the Tachitron. Through these programmed laboratory experiences the student can proceed at his own rate, sharpening his abilities to perceive musical intervals, sounds and rhythms. The "controlled" laboratory situation provides the teacher with an opportunity to be a better professional and researcher through analysis of learning behavior.

Part II (Time: 10:00) subtitled Analysis of Musical Behavior shows how Dr. Edward Maltzman at the Leslie Ellis Elementary School in Cambridge, Massachusetts used teaching machines to investigate the nature of musicality. Musical behavior is broken into basic component skills and taught to learners using techniques of matching, shaping, and fading that are part of any Skinnerian programming technique. The electronic program devices and feedback systems used are specially designed for this project.

Concluding remarks by Professor B.F. Skinner point up the possibilities, through such research, of of making musicality, along with other creative learning, a matter of well-programmed instruction--a set of planned and rewarding experiences rather than a series of lucky circumstances. Apart from the usual questions about teaching machines and programmed learning, this film raises the significant question: Can musicality, along with other forms of creative learnings, be programmed?

Summary

The Galaxy of Films described in the brief summaries above includes: 4 Planetary Films; 31 Asteroid Films; and 5 Satellite Films representing approximately four and a half hours of screen time. It is a documentation of communications networks and examples of technology in education in more than 25 geographic locations from Portland, Oregon to Miami, Florida, from Boston to Los Angeles. It is, above all, a reflection of the thinking of scores of theorists, researchers, communications specialists, teachers, and administrators whose direct comments form the backbone of this series of film documents on communication and the new media of education.

PART II

UTILIZATION UNLIMITED

The project staff, in producing this Galaxy of films, has been both structure-conscious and content-conscious. The attempt has been to develop a design which would not only be an effective and comprehensive representation of developments in the new media of education, but also a collection and organization of flexible film materials deliberately aimed at extending and enriching the possibilities for utilization. The theory is simply that instructional films should have the user (i.e., the instructor) in mind as well as the so-called "target" audience.

"The audience" for any message today is more difficult to define than it has been in the past because even in formal educational settings, there is a wider range of experiences, a greater variety of groupings, and larger number of individualized objectives at which the somewhat remote producer of instructional materials must aim.

The only one who can precisely define the audience, its purposes, its needs, and the specific instructional objectives involved, is the instructor himself. For the producer, it is much easier to define the kinds of instructors who might be using his films than it is to define the ultimate student audience. The educational media specialist, theorists in the field of communication, and instructors in audio-visual programs, have common concerns expressed in the titles of the four Planetary and five Satellite films in this series. The Galaxy of films and this Utilization Manual, have been designed for those responsible for getting communication theory into practice in public education. The intent is to place in the hands of these key people a collection or repertoire of rich, provocative film material suffused with suggestibility, and designed for maximum utilization.

The Design

The Galaxy of films in this series is conceived as a systematic exploration of four major aspects of communication and the media of education which, when used in the ways suggested in this Manual, will document some of the major developments, important information, seminal ideas, and some of the vital issues in the field.

The package, however, is designed to be broken down and reassembled by those instructors whose course program is varied or whose students are specialized, or advanced, so that entirely new combinations of ideas or concepts may be developed by juxtaposing individual segments of the larger films. There is an obvious and rather close parallel between this filmic structure and Gagne's concept of hierarchy of knowledge which suggests programming of instruction according to a logical hierarchy of behavioral repertoires.[1]

This structure of the Planetary films makes it possible to serve two seemingly opposite ends. On the one hand, they present a highly programmed unit in communication theory and instructional media. On the other, they are composed of smaller, but discretely designed segments from which a teacher in the field of communication may choose, cafeteria-style, to serve his own special instructional needs. The material, though "packaged," is yet "unpackagable."

The teacher may assemble film clips from one or more Planetary films, and actually structure a film of his own. This design puts the teacher in control of the utilization situation. He is free to use the films as systematized packages, or he may create his own "branching" system to meet the immediate needs as he sees them. This is probably the first time that a high degree of flexible utilization has deliberately been built into the production of filmed materials to the extent that the teacher is expected and encouraged to be in control of the material to the point of physically altering the original content and adapting and rearranging it to meet the needs of the target audience and his own instructional objectives beyond those originally intended by the producer.

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[1] Gagne, Robert M. "The Acquisition of Knowledge," cited by John P. DeCecco (ed.) Educational Technology (New York: Holt, Rinehart, and Winston, 1965), pp. 115-131.

The Asteroid films are both short and episodic, and when used individually, do not impose a strong structure on the user, or the viewer. When used as part of the Planetary film, each Asteroid builds on the preceding Asteroid, sophisticating and elaborating the theme of the Planetary film. Each Planetary film begins with the more concrete and immediate examples or Asteroids and builds to the more abstract and futuristic sequences.

The Satellite films, in the same way, are "open-ended", leaving conclusions to the consideration of the instructor and the student of educational communication--placing the burden of "discovery" upon them.

The skeletal design of the Galaxy, then, is that:

The Planetary Films:

1. Present four major, common themes of any consideration of communication and education.

2. Present four major protagonists (Dale, Gerbner, Norberg, Finn) without making it "their film".

3. Present a reasonable "package" or core-material for a study of communication and education.

4. Present a realistic film document on the state of the art as it exists today told by the people who lived in the situation.

5. Are composed of a series of independent, yet related sequences arranged to build the major idea beginning with the more concrete examples and moving to progressively more sophisticated development of the same basic idea through more complex examples.

6. Bring the theme progressively closer to the classroom teacher with each sequence, the final Asteroid in each being the most specific applications of communication theory to practice.

The Asteroid Films:

1. Are designed so they may be used independently to document a major idea about communication theory; the so-called new media of education; a media-mediated teaching-learning situation; or a professional point of view.

2. Deal with specific information, but at the same time a degree of ambiguity has been deliberately built into each sequence. The basic information has been provided, but much more is suggested than stated in most Asteroids.

3. Are coded with identification imprinted along the edge of each, so that they may be easily and quickly located in the Planetary film; removed; and replaced in their original location.

4. Are varied stylistically, ranging from animation to dramatic dialogue--technique being dictated by content and purpose--not by traditional film form.

The Satellite Films:

1. Are composed of two discussion films (Communications Conference and Communications Revolution); a kinescope recording (Teacher Centered Television); a two-part research document, each of which may be used separately as an Asteroid (Music Research); and a film document on an historical phase of instructional technology (Teaching Machines and Sidney Pressey).

2. Provide background in depth for ideas suggested in the Planetary films, but at the same time are largely "open-ended."

3. Are "spin off" materials developed during the course of major production, in some cases testing production theories which were later, in some cases, put into practice in producing the Planetary films (e.g., the discussion films were in part "screen tests" to test lighting, voice qualities, and camera angles on protagonists who later appear in the major films; the film on music research was in part a test of the feasibility of composing a film from two essentially independent but related case histories in what later became the Asteroid idea).

4. May be used as conventional films, but have a special life and significance when seen in relation to the Galaxy from which they originated, and to the major ideas to which they owe their being. They are likely to be of most value when viewed as part of the package.

The advantages of this modular design appear to be considerable, including at least the following:

1. Each idea may be developed in a filmic style most appropriate for the content, rather than being confined to a single style for the sake of consistency necessary in most conventional film forms.

2. An Asteroid may be removed from a Planetary film (because of obsolescence, to speed up the presentation, or for reasons including inappropriateness for the viewers involved, or simply that "it doesn't work") without destroying the value or continuity of the rest of the material.

3. Modular structure permits branching, not only "lineally" within the same film (by dropping out segments and moving to the abstract more quickly); but also "horizontally" (by selecting and assembling in a new arrangement Asteroids from one or more Planetary films).

4. Logistically, the coding and segmentation of the Asteroids makes identification easier; simplifies the matter of ordering new segments, reducing the possibility that they may be unidentifiable when removed from the main title; makes possible the economic stockpiling of "most used" segments by the laboratory for immediate supply purposes.

5. The wide range of screen times provided by all parts of the Galaxy makes it easier to program the material as television segments, or as cartridge-loaded 8mm presentations.

6. The scope of all materials taken together is "wide-scan", and largely teacher-centered. As mentioned earlier, this is probably the first time that film materials have been intentionally designed to be taken apart

> and re-edited by the teacher, in order to meet strategic instructional objectives which can never be fully anticipated by the producer of such materials.

Editing the Asteroids

If there is one single, most universally understood rule about the use of non-threatical motion pictures and especially those used in instruction, it is: "Don't cut the film."

Rental libraries, public school film libraries at the state and local levels, and college and university audiovisual centers necessarily impose this regulation, along with specifications for repairing, rewinding or non-rewinding of films to maintain and protect the material intact, in its original form.

The intent in the Galaxy films, however, is that they may be altered, edited, and reassembled, as a necessary condition for maximum utilization in meeting individual instructional needs. It should be remembered that the users in this case are not "average classroom teachers" at large, but rather media-oriented instructors in most cases either with experience in film handling or with access to motion picture personnel and facilities as in the case of those associated with audiovisual resource or production centers.

At the same time, it is recognized that there are two major barriers to usage in this mode.

1. The psychological barrier involves the question of whether even media-oriented instructors will take the time to cut and splice material. Will they be sufficiently motivated or stimulated by the information and ideas contained in the Galaxy to use the films to the maximum in the non-linear manner suggested in this Manual? To what extent will they be able to overcome the tradition and habit of using films intact--from the can--instead of "rolling their own"? This is a subject for study in itself.

2. The mechanical barrier is, of course, related to the psychological. Unless the act of cutting and splicing is a very simple, easy one, it is unrealistic to expect the material to be used in the manner suggested. One solution to ease the use of Asteroids (which are from approximately one to eleven minutes in length) would be to put them into 8mm cartridges for use in a Fairchild-type projector. While such use is anticipated, this alone does not completely solve the problem of how to maximize the films in whole, as well as in parts in 16mm with large groups where 8mm rear-screen projectors may not have the capacity in terms of length or image size to serve the purpose. Also, cartridges are, like reels of conventional films, "canned" and not easily accessible for re-editing.

Another possible way to rearrange and simplify the use of the material might be to re-record from film to a classroom-type video tape recorder. This system, for the moment, is neither accessible nor economic in most settings, although it may become more useful in the future.

The simplest and most economic method of editing the material at present seems to be in the use of an inexpensive splicing block, a single-edged razor blade, and 16mm perforated splicing tape, illustrated in Appendix A. The steps in editing an Asteroid out of a Planetary film are these.

1. The Asteroid is identified by the code on the edge of the film, corresponding to the title of the Planetary film of which it is a part and the position it occupies in that film. For example the Asteroid describing the major steps in the process of communication is edge numbered "Proces-Com-1". This means it is the first Asteroid in the Planetary film, The Process of Communication.

2. The code number may be located by visual inspection, reeling the film between bench rewind spindles where convenient, or on the projector where necessary.

3. The first code identification begins in the middle of the fade-in at the head of the Asteroid and continues to the middle of the fade-out at intervals of one foot. The fades (black areas) between each Asteroid and the sound track have been located in such a way that neither picture or sound will be violated by a cut in the middle of the fade, or by subsequent cuts in an area of approximately one foot or 20 frames on either side of the middle of the fade.

4. The middle of the fade-in is placed, emulsion or base (shiny) side up, on the splicing block, and the razor is used to cut the film parallel to the frame-line. A 3 or 4 foot section of blank leader (preferably single-perforation) is placed on the splicing block with the perforations matched to those of the Asteroid and the razor is used to cut the leader on the parallel.

5. A four-frame section of splicing tape is cut off the roll, and with both the leader and head of the Asteroid positioned on the pins of the splicing block, the perforations of the tape are slipped over the pins in the splicing block over the cut ends of the film so that the perforations in the tape match those on either side of the cut. The tape is then pressed onto the film to secure good adherence.

6. The leader is fed onto a reel, and the attached Asteroid is reeled up (using the projector or a rewind).

7. The end or fade-out of the Asteroid is located, cut, and spliced either to tail leader or to the middle of the fade-in of a subsequent Asteroid in the same manner.

8. The remainder of the Planetary film is spliced together in the same manner so

it is intact and useable.

9. The edited Asteroid(s) is rewound for projection.

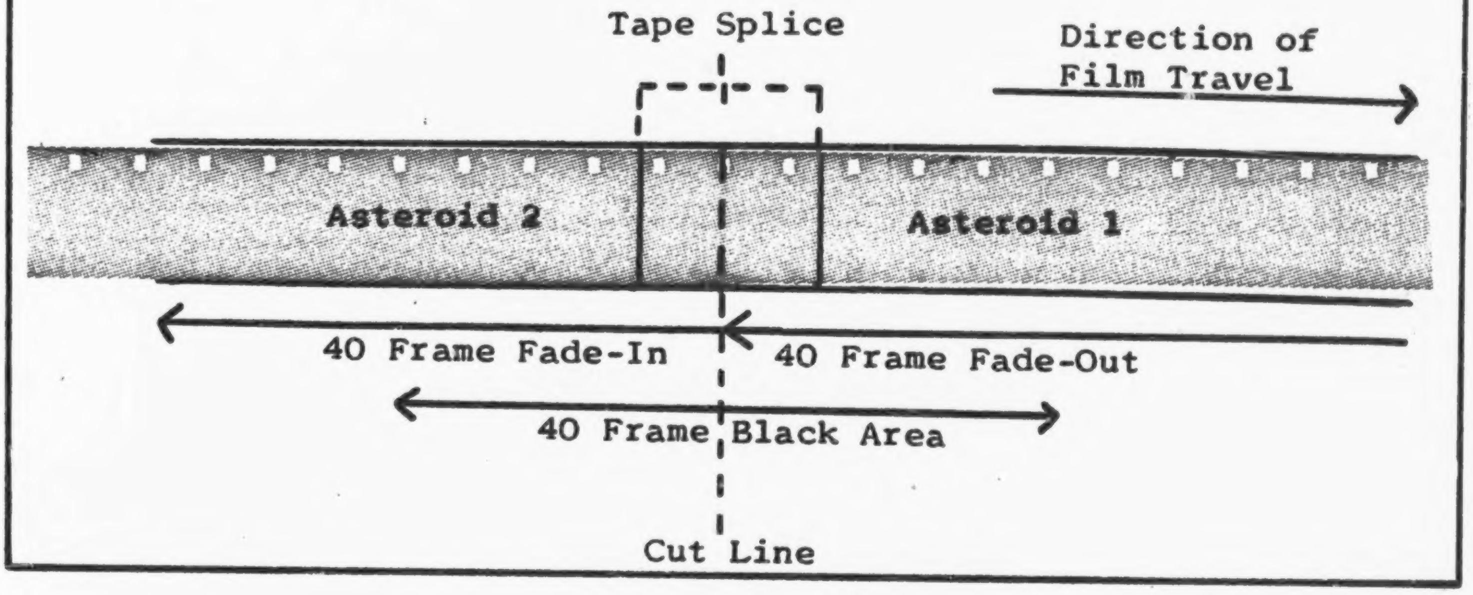
When the Asteroid(s) is replaced in the original position in the Planetary film, the same procedure is followed in reverse. The splicing tape is removed, and the cut ends of the Asteroid and the Planetary film will match and may be tape-spliced without loss of a frame. This system makes it possible to cut such an Asteroid in and out of a Planetary film a considerable number of times without loss of footage.

In some cases it may be desirable to use conventional film splicing methods, which means the loss of a frame every time the film is cut. Even here, there is considerable leeway, since approximately one foot or 40 frames may be dropped in splicing without losing essential information. The beginning and end of each Asteroid has been designed with picture and audio information cushions so that loss or damage at the head and tail is minimized.

With a little practice in applying the tape, it is felt that the technical barrier to utilization in the mode suggested here, will be overcome. It is also reasonable to expect that some instructors will eventually order separate Asteroids which they use most as "on the shelf" items, leaving the Planetary films intact for general screenings. (See Fig. II.)

FIGURE II

Schematic for Tape Splicing Two Asteroids Together


Tape Splice
Direction of Film Travel
Asteroid 2
Asteroid 1
40 Frame Fade-In
40 Frame Fade-Out
40 Frame Black Area
Cut Line

Patterns of Use

Including the four Planetary films, thirty-one Asteroids, and five Satellite films, a total repertoire of 40 filmic experiences is presented in this Galaxy. This is a potential of 1600 possible combinations in which this material may be edited, or arranged.

The ultimate and most fruitful uses will, of course, depend on the perceptivity and creativity of individual instructors and their willingness to study the film material for its potential usefulness in their own teaching. It will also depend, in part, upon their understanding of the medium itself.

The motion picture is a "high information" medium. A single frame of film (not to mention the scene or the sequence) in addition to the information deliberately "cued" to convey the intended message, may include a considerable amount of "redundant" or unintended information. While an excess of such information is undesirable in a linear, informational message, there is probably an irreducible minimum of redundant and/or extraneous information in every human communique which is perceived by at least some part of every audience. In some cases, such unintentional information may be helpful, serendipitous, and, if deliberately considered as part of the message design, may infuse certain types of information with desirable, suggestive, provocative, and rich background values in addition to the immediate and intentional foreground information.

While, in the present films, the primary consideration has been to develop a series of informational film documents, a great variety of "to whom it may concern" messages exist throughout the material. It is these kinds of "discoverable" values which may, in the long run, make the material most exciting and useful to both teachers and students, as they add their own perceptions to the images that appear on the screen.

As a starter, however, there are several usage patterns into which the material could fall (vertically and horizontally as well). A few of these obvious usage patterns are suggested in the following pages.[2]

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[2] See Appendix B for pre-production research relevant to usage patterns.

USAGE PATTERN

A. Media in Instruction

SATELLITE CODE:
Communications Conference--S-1 Communications Revolution--S-2
Multiple Option Television--S-3 Teaching Machines--S-4
Music Research--S-5

DESCRIPTION	PLANETARY	ASTEROID	SATELLITE
Amplified Telephone	INFO EXPL	4	
	TEACH TECH	4	
Audio Tape	INFO EXPL	4,5	
	PERCEPTION	3	
	TEACH TECH	4,6,7,8	
Chalkboard	PROCES COM	4	
	TEACH TECH	4,7	
Computers	INFO EXPL	2,4	
	PROCES COM	7	
	TEACH TECH	1,6,7	
Demonstrations	PERCEPTION	6	
	PROCES COM	3	

A. Media in Instruction (Continued)

DESCRIPTION	PLANETARY	ASTEROID	SATELLITE
Direct Experience	PROCES COM	3,8	S-2
	PERCEPTION	1,4,5,6	
	TEACH TECH	7,10	
8mm Film	PERCEPTION	5	
	PROCES COM	6,7	
Exhibits, Models, Displays	INFO EXPL	4	
	PROCES COM	3	
	TEACH TECH	1	
Information Satellites	INFO EXPL	1	
	TEACH TECH	10	
Listening (language) Labs	TEACH TECH	5	
Motion Pictures	PROCES COM	4,5,6,7	S-2
	PERCEPTION	3,5	
	TEACH TECH	3,6,7,9,10	
Multi-Media Approach	TEACH TECH	3,4,5,6,7,10	S-3
	INFO EXPL	4,5,6	
	PROCES COM	3,5,6	
	PERCEPTION	1,2,3,4,5	

A. Media in Instruction (Continued)

DESCRIPTION	PLANETARY	ASTEROID	SATELLITE
Overhead Projector	INFO EXPL	4	
	PROC COM	4	
	TEACH TECH	3,5,6	
Printed Materials, Libraries	INFO EXPL	1,2,6	S-2
	TEACH TECH	3,4,6,7,10	
Programmed Instruction	PERCEPTION	3	S-4; S-5
	TEACH TECH	8,9	
	PROCES COM	7	
Radio	INFO EXPL	5,6	S-2
Simulation	PROCES COM	3,4,6	
Slides	PERCEPTION	4	
	TEACH TECH	4,9	
Teaching Machines	PROCES COM	6,7	S-4
Television	INFO EXPL	3,6	S-2; S-3
	PROCES COM	7	
	TEACH TECH	3,7,9,10,11	

A. Media in Instruction (Continued)

DESCRIPTION	PLANETARY	ASTEROID	SATELLITE
Video Tape	TEACH TECH	3,9,10	S-3

USAGE PATTERN

B. Media and Subject Content

SUBJECT MATTER FIELD	PLANETARY	ASTEROID	SATELLITE
Educational Administration	PROCES COM	5	
Industrial Training	PROCES COM PERCEPTION	3 3	
Languages	TEACH TECH	5,6,8	
Literature	TEACH TECH	3,4,5	S-2
Mathematics	TEACH TECH	5,7	
Medicine	INFO EXPL	5	
Military Training	PROCES COM	4	S-1; S-3
Music	TEACH TECH	8,10	S-5
Sciences	PROCES COM TEACH TECH	7,8 6,7	
Social Studies	PERCEPTION	4,5,7	
Teacher Education	PROCES COM	5,6	

USAGE PATTERN
C. Media and Instructional Groupings

INSTRUCTIONAL GROUPING	PLANETARY	ASTEROID	SATELLITE
Pre-School	PERCEPTION	1,5	
Elementary	INFO EXPL	6	S-5
	PERCEPTION	1,5	
	TEACH TECH	1,5,7	
	PROCES COM	7	
Secondary	INFO EXPL	6	
	PROCES COM	7,8	
	TEACH TECH	5,6	
College-University	TEACH TECH	4,8,9	S-3; S-5
	PROCES COM	5,6	
Adult Education Programs	PERCEPTION	3	
	TEACH TECH	3	
	INFO EXPL	4,5	
	PROCES COM	3,4	
Special Education	PERCEPTION	1,4,5	S-5
Military Training	PROCES COM	4	S-3
	TEACH TECH	3	

C. Media and Instructional Groupings (Continued)

INSTRUCTIONAL GROUPING	PLANETARY	ASTEROID	SATELLITE
Industry Training	INFO EXPL	4	
	PROCES COM	3	
	PERCEPTION	3	
Large Group Instruction	INFO EXPL	3,5	
	TEACH TECH	6,8,9,10	
	PROCES COM	4,7	
Small Group Instruction	INFO EXPL	4	S-3
	PROCES COM	3,4,5,6,8	
	PERCEPTION	3,4,5	
	TEACH TECH	3,4,5,6,10	
Independent Study	INFO EXPL	1,2,3	S-4; S-5
	PROCES COM	6,7	
	TEACH TECH	1,5,6,7,8,10	
Ungraded, Continuous Progress Programs	PROCES COM	7	
	TEACH TECH	5,6,7,10	

USAGE PATTERN

D. Specialized References

CENTRAL REFERENCE OR THEME	PLANETARY	ASTEROID	SATELLITE
Audiovisual Center, The	PROCES COM	4	
	TEACH TECH	3,5,6,7,9,10	
	INFO EXPL	4	
Audiovisual Specialist, The	PROCES COM	4	
	TEACH TECH	3,6,7	
Face-to-face Communication	INFO EXPL	1,3,4,5,6	S-1; S-2
	PROCES COM	5,8	
	TEACH TECH	5,6,7,11	
	PERCEPTION	3,4,5	
Freedom of Communication, Feedback, and Responsibility	INFO EXPL	1,3,6	S-2
	PROCES COM	2,3,4,5,8	
	PERCEPTION	2,4,6	
	TEACH TECH	4,7,11	
History of Communication	INFO EXPL	1,2,3,6	S-2
	PERCEPTION	1	
	TEACH TECH	2	
Psychology of Perception	INFO EXPL	6	S-1
	PROCES COM	2,5	
	PERCEPTION	1,2,3,4,5,6	
	TEACH TECH	7	

D. Specialized References (Continued)

CENTRAL REFERENCE OR THEME	PLANETARY	ASTEROID	SATELLITE
Role of the School Administration	INFO EXPL	3,4,5	S-1
	PROCES COM	5,6	
	PERCEPTION	3	
	TEACH TECH	2,3,5,7	
Role of the Teacher	PROCES COM	1,2,4,6,7,8	S-1; S-2;
	PERCEPTION	5,6	S-3; S-4;
	TEACH TECH	3,4,5,6,7,9,11	S-5
	INFO EXPL	6	
School Architecture	INFO EXPL	4	
	PROCES COM	3,4,6,7	
	TEACH TECH	1,3,4,5, 7,8,9,10	
Team Teaching	INFO EXPL	5	
	PROCES COM	4	
	PERCEPTION	5	
	TEACH TECH	4,7,11	
Testing and Research	PROCES COM	6,7	
	PERCEPTION	3	
	TEACH TECH	1,5,7,9,10	

USAGE PATTERN

E. Reference to Principal Institutions and Geographic Locations

INSTITUTION AND LOCATION	PLANETARY	ASTEROID	SATELLITE
Cambridge, Massachusetts Leslie Ellis School			S-5
Champaign, Illinois University of Illinois	PROCES COM	7	
Chicago, Illinois United Airlines Hostess School	PROCES COM	3	
Chicago, Illinois United Airlines Briefing Room	INFO EXPL	4	
Cincinnati, Ohio Children's Hospital Res. Foundation	INFO EXPL	5	
Colorado Springs, Colorado Air Force Academy	TEACH TECH	3	S-3
Columbia, Missouri Stephens College	TEACH TECH	4	
Columbus, Ohio Headstart Program	PERCEPTION	5	
Columbus, Ohio Ohio State University, The	PROCES COM TEACH TECH	5 8	S-4; S-5

E. Reference to Principal Institutions and Geographic Locations
(Continued)

INSTITUTION AND LOCATION	PLANETARY	ASTEROID	SATELLITE
Columbus, Ohio Grant Hospital	INFO EXPL	5	
Columbus, Ohio WOSU Radio	INFO EXPL	5	
Ft. Leavenworth, Kansas Command & Gen. Staff College	PROCES COM	4	
Ithaca, New York Cornell University	PERCEPTION	2	
Los Angeles, California University of Southern California	TEACH TECH	2	
Miami, Florida University of Miami	TEACH TECH	9	
Monmouth, Oregon University of Oregon	PROCES COM	6	
Philadelphia, Pennsylvania Annenberg School of Communication	PROCES COM	2	

E. Reference to Principal Institutions and Geographic Locations
(Continued)

INSTITUTION AND LOCATION	PLANETARY	ASTEROID	SATELLITE
Portland, Oregon John Marshall High School	PROCES COM TEACH TECH	8 6	
Princeton, New Jersey Princeton University	PERCEPTION	2	
Provo, Utah Brigham Young Univ. Lab School	TEACH TECH	5	
Sacramento, California Sacramento State University	PERCEPTION	2,6	
Sarawak Peace Corps	PERCEPTION	4	
St. Louis, Missouri Valley Winds Elementary School	TEACH TECH	7	
Washington, D.C. White House Press Conference	INFO EXPL	3	

USAGE PATTERN

F. Individuals Quoted on Film

NAME OF RESEARCHER/WRITER/TEACHER	PLANETARY	ASTEROID	SATELLITE
Rex Arnett, Language teacher, Brigham Young Experimental School	TEACH TECH	5	
Donald L. Bitzer, PLATO Research, University of Illinois	PROCES COM	7	
Vance Bourjoilly, Author	TEACH TECH	4	
Hadley Cantril, Chmn. Bd., Inst. Intrn. Social Res., Princeton Univ.	PERCEPTION	2	
Chester Caton, Capt., Air Force Academy	TEACH TECH	3	S-3
Louis Chatterly, Math teacher, Brigham Young Laboratory School	TEACH TECH	5	
Edgar Dale, Prof. Education, Ohio State University	INFO EXPL	1,2,6	S-1; S-2
John Dos Passos, Author	TEACH TECH	4	
Shirley Duncan, Headstart teacher, Columbus, Ohio	PERCEPTION	5	

F. Individuals Quoted on Film (Continued)

NAME OF RESEARCHER/WRITER/TEACHER	PLANETARY	ASTEROID	SATELLITE
Richard Dwyer, 4th grade student, Columbus, Ohio	INFO EXPL	6	
Susan Eaker, Headstart teacher, Columbus, Ohio	PERCEPTION	5	
Ralph Ellison, Author	TEACH TECH	4	
James D. Finn, Prof. Education, University of Southern Calif.	TEACH TECH	2,11	S-1
Harvey Gelder, Secondary Science Teacher, PLATO Programmer	PROCES COM	7	
George Gerbner, Dean, Annenberg School of Communication	PROCES COM	2,5,8	S-1
James Gibson, Dept. Psychology, Cornell University	PERCEPTION	2	
Belden Hare, Elementary teacher, Valley Winds School, St. Louis, Mo.	TEACH TECH	7	
Lamar Hendrickson, English teacher, Brigham Young Laboratory School	TEACH TECH	5	
W. Phil Herriott, Director, Educ. & Training, United Air Lines	PERCEPTION	3	

F. Individuals Quoted on Film (Continued)

NAME OF RESEARCHER/WRITER/TEACHER	PLANETARY	ASTEROID	SATELLITE
H.B. Hitchens, Director, A-V Services, Air Force Academy	TEACH TECH	2	S-3
Charles Hoban, Prof. Education University of Pennsylvania			S-1
Leola Johnson, 10th grade student	INFO EXPL	6	
J.F. Kennedy, President, U.S.A.	INFO EXPL	3	
Bert Y. Kersh, Assoc. Dir., Teaching Res. Div., Oregon State System of Higher Education	PROCES COM	6	
Janice King, Headstart teacher Columbus, Ohio	PERCEPTION	5	
Franklin Knower, Prof. Speech, Ohio State University			S-1
James Lanman, Curriculum Supervisor, Valley Winds School, St. Louis, Mo.	TEACH TECH	7	

F. Individuals Quoted on Film (Continued)

NAME OF RESEARCHER/WRITER/TEACHER	PLANETARY	ASTEROID	SATELLITE
Elizabeth Lyman, PLATO Research, University of Illinois	PROCES COM	7	
Charles Madden, Head, Comm. Dept., Stephens College	TEACH TECH	4	
Charles Mansfield, formerly Principal, Valley Winds, St. Louis, Mo.	TEACH TECH	7	
Edward Maltzman, Music Educator, Cambridge, Mass.			S-5
Marshall McLuhan, Dir., Ctr. of Culture & Tech., University of Toronto	INFO EXPL	6	S-2
Kenneth Norberg, Prof. Education, Sacramento State University	PERCEPTION	2,3,6	S-1
William Oberteuffer, Science Teacher, John Marshall High School	PROCES COM	8	
Lynn Patterson, former member, Peace Corps	PERCEPTION	4	

F. Individuals Quoted on Film (Continued)

NAME OF RESEARCHER/WRITER/TEACHER	PLANETARY	ASTEROID	SATELLITE
Mary Anne Penzone, Headstart teacher, Columbus, Ohio	PERCEPTION	5	
Gaynor Petrequin, Principal, John Marshall High School	TEACH TECH	6	
Paul Pimsleur, Director, Listening Center, Ohio State University	TEACH TECH	8	
Sidney Pressey, Prof. (Emeritus) Psychology, Ohio State University			S-4
Robert Prochnow, Math teacher, Valley Winds School, St. Louis, Mo.	TEACH TECH	7	
John A. Ramseyer, Director, School of Education, Ohio State University	PROCES COM	5	
Cynthia S. Rigel, Headstart teacher Columbus, Ohio	PERCEPTION	5	
Albert B. Sabin, M.D., Childrens Hospital Research Foundation	INFO EXPL	5	

F. Individuals Quoted on Film (Continued)

NAME OF RESEARCHER/WRITER/TEACHER	PLANETARY	ASTEROID	SATELLITE
Wilbur Schramm, Dir., Comm. Res. Stanford University	INFO EXPL	1	
Gilbert Seldes, Dean Emeritus, Annenberg School of Communication	INFO EXPL	6	S-2
B.F. Skinner, Prof. Psychology Harvard University			S-4; S-5
Charles Spohn, Prof. Music, Ohio State University			S-5
Lawrence M. Stolurow, Prof. Psychology, University of Illinois	PROCES COM	7	
Suzanne Talbott, Headstart teacher, Columbus, Ohio	PERCEPTION	5	
Brenda R. Taylor, Headstart teacher, Columbus, Ohio	PERCEPTION	5	
Lowell Thomson, Principal, Brigham Young Laboratory School	TEACH TECH	5	
I. Keith Tyler, Prof. Education, Ohio State University	INFO EXPL	6	S-2

F. Individuals Quoted on Film (Continued)

NAME OF RESEARCHER/WRITER/TEACHER	PLANETARY	ASTEROID	SATELLITE
Carolyn Wendelken, Teacher, Valley Winds School, St. Louis, Mo.	TEACH TECH	7	

Note: For production stills of the four major participants in the Planetary films, see Appendices C and D.

The usage patterns here suggested are not intended as an exhaustive index of the content of the Galaxy of films, but rather as springboards for thinking about new combinations of the material which will, in turn, stimulate creative applications in instructional situations.

The listing of Asteroids containing statements about communication and media (Usage Pattern F), for example, could be used to pull out "quotations" as we commonly do from printed materials. Or, one could assemble a series of compatible or contradictory views composed of segments from Hoban, Gerbner, Dale, or McLuhan. Asteroid INFO EXPL 7 in which Dale and Schramm give the historical background of the communications revolution, might be followed by the Asteroid TEACH TECH 2 in which Finn outlines the development of instructional technology. Together, in about 11 minutes of film time, the attention of the audience could be concentrated on historic perspectives.

Other similar horizontal structures of Asteroid segments could produce composite pictures of such diverse aspects as: the image of the teacher; the role of feedback in the communications system; the use of rear-screen projections; the validity of media research projects portrayed. Questions could be raised such as: "What is the price of technology in education?" "Are the technological systems shown too complex for most existing educational systems?" "Are they too expensive in terms of existing school budgets?" "How may communication be considered as method, value, and social fact?"

Some of these basic questions and referents found in the films are further clarified in Part III of this Manual. Others, it is hoped, will emerge as patterns of usage are reported by instructors willing to diagnose the material further, do the necessary "surgery" and thereby make the films more operable and the viewers more knowledgeable.

PART III

COMMUNICATION AND EDUCATIONAL MEDIA

The Galaxy of films described in the preceding sections presents many different concepts about communications and educational media. We have, for instance, talked about the psychology of human perceptions and communication theory. We have presented examples of instructional technology, shown computers, and simulation being used in schools, and raised questions about their implications for classroom learning and teacher responsibilities. We have referred to instructional units, curricula, and school plants. We have also discussed the information explosion, and the communication revolution and raised questions about the implications for education, social living and, indeed, for Western civilization.

The inter-relationships between all these different concepts are not easy to define.

As has been indicated, the package presented here includes two types of material; (1) the programmed material (Planetary films) that would, hopefully, lead the viewers step by step toward definite instructional objectives, and (2) non-programmed, open-ended material (Satellite and Asteroid films) that serve a pointing function--indicating directions, raising questions, rather than leading by the hand. The non-programmed potential of the Asteroids and Satellites prompts more questions than answers. The Satellite film, Communication Revolution, for example, examines the many different questions about the nature of the media, print versus the image, changing human patterns for coping with reality, but it supplies no final conclusions. A considerable portion of this material is a record of unrehearsed conversation by a panel of high-level theorists, and beginning students of communications and educational media may have difficulty in picking up the crucial concepts or relating them to each other in any logical or formal structure. The usefulness of this, and other Satellite and Asteroid films, depends upon the skill and understanding with which they are used by the instructor who introduces these film experiences.

In this chapter, we aim to provide a logical way of relating the different concepts presented in the Galaxy. It will be a minimal logical and theoretical structure that will relate these concepts into a mutually explanatory whole. This formal structure of ideas will provide a "filing system" to readers for storing information about communication and educational media and relating questions to their proper factual and value origins.

Communication's Three Faces

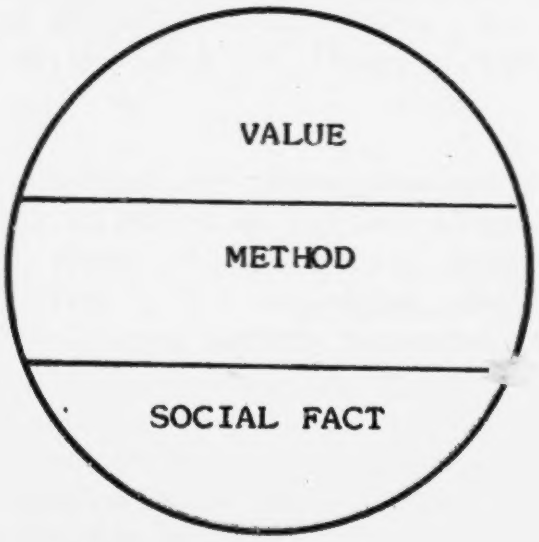
Communication is the warp and woof of all societies. Communication makes us human. Should this human ability be taken away, civilizations crumble, culture disappear, man becomes a brute.

It is not surprising that a concept as pervasive as communication should be used in many different senses, with many different meanings. Researchers and writers, with more or less success, have tried to define the concept of communication, understand it, and use it creatively.

In this section, we will talk of communication's "Three Faces." It should be understood that this is just one point of view, one model for understanding communication and connecting it with related concepts in education.

The model (Figure III) presents the three faces of communication--(1) Value, (2) Method, and (3) Social Fact or Environment. Communication is not only more or less effective, it is also good or bad. While the dimension of effectiveness is a question of method or engineering of information transfer, the good-bad dimension is a value question which would make communication a tool of education or propaganda, of democracy or totalitarianism. Finally, the industrial, or more appropriately, the electronic revolution has made communication an industry in which whole products are indirectly paid for and freely consumed.

FIGURE III
Three Faces of Communication



Communication is such a tremendous industry that it is almost the environment in which we live and breathe. Its sociological implications are far-reaching. It is a social fact of first importance in today's world. These three themes--Value, Method, and Social Fact or Environment--present a preliminary taxonomy for organizing all possible questions that can be raised about the quality, intent and implications of communication messages. They also present a scheme for relating communication with its foundations, antecedents, and manifestations.

Communication as Value

Communication takes place within the framework of a value system. A particular value system would determine the distribution of communication rights and communication obligations and, thereby, the nature of its social and political institutions. A value system that demands the young to obey the elders and not reason why, to respond to communications, but not communicate or feed back would most likely create a traditional, inflexible social system. A value system that denied the employees the right to communicate with their employer, or with each other, to bargain or redress grievances would most likely create a feudal system or worse.

The interaction between value systems, communication styles, and resulting social systems is even more dramatic in the case of political institutions. Under totalitarian systems, for example, the media of communication are owned completely by government. The government is the single "official" source of communication messages, and it insists that messages be received and consumed. The government is under no obligation to explain or communicate on all issues. There is no freedom not to listen.

In a democracy, on the other hand, freedom of speech means freedom to communicate. We do not insist that everybody listen, and consume messages; this is one means of insuring against conformity and indoctrination. We do not seek to have central control of the orgination and distribution of messages. We work consciously to create a multiplicity of communication sources and insist on excellence from all of them. We can see, then, that a particular philosophy about the nature of man and society, and a related value system, provide a particular communication style and distribution of messages and sources. And these, in turn, either enrich social systems or perpetuate tyrannies. Asteroid INFO EXPL 3 is useful as an introduction to the issue of freedom of communication.

The above discussion has emphasized the value dimension of communication. Keeping in mind the fact that communication thus has a value component, questions about pre-packaged instructional systems, teacher's responsibility with respect to learners or the master teacher on the ITV, the commercial basis of media in the United States with the media producer's responsibility may be related to their value origins. Edgar Dale's definition of communication as "sharing of ideas and feelings in a mood of mutuality" relates to communication as a value. It is probably also a good definition of method, but communication can be "effective" without sharing or without mutuality. Propaganda, thought-reform, "brainwashing" have been effective, but they have failed in the value dimension. In fact, our democratic orientation would not even let us consider these as communication situations. The Satellite films, The Communications Revolution, and Communications Conference, and the Planetary films The Information Explosion and The Process of Communication are concerned with communication as a value.

Communication as Method

Communication also has a method dimension. We often talk of the failure of communication--of not being understood or being completely misinterpreted in international relations, government, business, classroom, and personal relationships. Considerable research and theorizing has been done on understanding the process of communication as a tool or method for transfer of meanings.

Since communication takes place between people living in groups or working in institutions within larger social groups and cultures, the parameters of communication as a method are spread far and wide. Many disciplines, such as anthropology, sociology, linguistics, psychology, philosophy, have contributed to an understanding of the communication process. Communication, in turn, has enriched many areas of our social life, such as advertising and public relations, business and industrial management, classroom learning, political processes, and even personal areas, such as marriage, the family, and vocational success.

The research available in the foundational disciplines of communication, such as anthropology, sociology, linguistics, psychology, philosophy, and political science, is too extensive to summarize within the scope of this monograph. However, a synthesis of this research can be found in the theories of perception.

Perception and Learning

There is no one neat theory of perception. There are many. Some emphasize the physical world "out there," some emphasize "the psyche" of the individual perceiver, others emphasize "the transaction" between the individual and the physical world of being. Within these three general areas there are variations of positions taken by individual theorists. In the Planetary film Perception and Communication two influential positions are suggested--one represented by psychologist James Gibson, and the other by social psychologist Hadley Cantril. But these are just two of the many points of view about perception, as Kenneth Norberg points out in the same film.

A classroom teacher who is not a student of the psychology of perception need not be disheartened by this seemingly confused situation. Psychologists agree about the existence of differential perceptions among human beings and they have identified the communication blocks arising from individual perceptions. They disagree only in their explanations of why differential perceptions occur. For the teacher, therefore, it is not an impossible choice. He may select an approach and learn to live with it. In fact, an excellent synthesis of perception theories is suggested by Krech and Crutchfield who mention two major determinants of perception: (1) structural factors deriving solely from the nature of the physical stimuli; and (2) functional factors which derive primarily from the needs, moods, past experience, and memory of the individual.[3] Four basic propositions related to perception are stated.

1. The perceptual and cognitive field in its natural state is organized and meaningful.
2. Perception is functionally selective.
3. The perceptual and cognitive properties of a substructure are determined in large measure by the properties of the structure of which it is a part.
4. Objects or events that are close to each other tend to be apprehended as parts of a common structure.

A teacher doing an effective job of teaching should then understand that he is a person with his own particular perceptions based on his need, goal, and value system and that his students are, at the same time, prisoners of their own individual perceptions. All learning will, in a sense, be filtered through learners' perceptions and will sometimes be blocked by their perceptions. In such cases, the teacher will be working to change his learners' perceptions (Fig. IV) and therefore learning can be viewed as an act of acquiring new and meaningful perceptions, and the school as a storehouse or a bank of perceptions. Asteroid films which help illuminate how social, cultural, and personal perceptions affect the communications process are PERCEPTION 3, 4, and 5.

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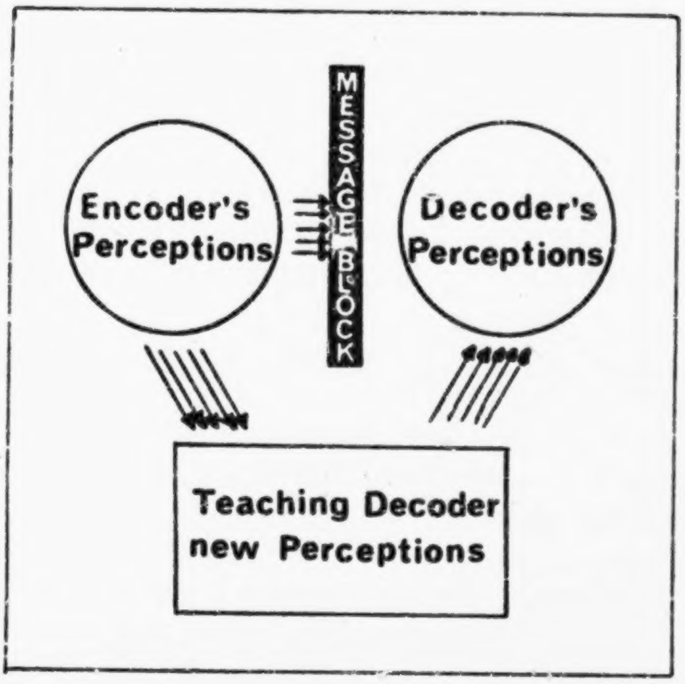
[3] Wilbur Schramm (ed.), The Process and Effects of Mass Communication (Urbana: University of Illinois Press, 1954), pp. 116-137, citing David Krech and Richard S. Crutchfield.

FIGURE IV


MESSAGE BLOCK
Encoder's Perceptions
Decoder's Perceptions
Teaching Decoder new Perceptions

Models of Communication

The preceding discussion under the section "Communication as Method" should provide some insights into the complexity of the communication process by pointing out its many antecedents and by relating it to its various foundations.

But how do we use what we know about the communication process to solve our communication problems inside and outside the classroom? How do we use the understandings from these various foundational disciplines to communicate effectively? How do we go about increasing first, the probability, and then the productivity of the communication act and communication events? One way is to look at the process by means of a model.

The word "model" may be used in three different ways. One is used to refer to a "pre-theory." It is a theoretical point of view generally represented in the form of a graphic diagram to suggest variables of the communication process and the relations and interactions between these variables. Two, the word "model" is used to imply a more concrete, nearer-to-reality representation of a known but abstract and elusive phenomenon. A globe, for example, is a model of the earth, and we have models of molecules and atoms. Three, the word "model" is used in the sense of "the ideal" and "the exemplary," as in "model behavior."

The film, The Process of Communication, begins by presenting a "model" of the process of communication. These are theoretical models, points of view about the process of communication. The Asteroid, "PROCES COM 1" for example, is a composite model drawn from Lasswell, Schramm, and Gerbner. It should be understood that there are many more models (points of view) about the process of communication. The model suggested by Shannon and Weaver, for example, is perhaps more often used by researchers because it is directly related to the influential tradition of research in information theory.[4]

The film next presents some "models" of communication in the sense that they are closer to reality--concrete and controlled communication situations which present the theoretical concepts of encoders, decoders, messages, and feedback in terms of learners, teachers, program inputs, and response reception as feedback. The PLATO and SOCRATES simulators (PROCES COM 7), the military simulation model (PROCES COM 4), simulation model in industry (PROCES COM 3), simulation model of educational administration (PROCES COM 5), and teacher training situations (PROCES COM 6), are all "models" in this latter sense. They are the intermediate halfway houses between theory and practice. They are not necessarily model situations in the sense of the ideal or the exemplary. They are, necessarily filmically restructured for purposes of study and control, and, to that extent, of course, distant from real-life communication situations.

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[4] Claude E. Shannon and Warren Weaver, The Mathematical Theory of Communication (Urbana: The University of Illinois Press, 1949).

Information Technology

The phrase "information technology" is now often used in literature by educators, industrialists, businessmen, social workers, politicians. Information technology, as we indicated earlier, is the child of the communication revolution. It consists of two components--the psychological and the technological. Educators often believe that they are engaged in a purely ideational enterprise and respond negatively to the whole idea of information technology in education. Some view technology with suspicion, fear, or derision.

The psychological component of information technology is as important as the electronic or technological component, if not more so. But, objectively, information technology is more than gears, transistors and punched cards. It involves use of all that we know about communication, about psychology of learning, of motivations, intrinsic and extrinsic rewards, about structure of knowledge and of the logical hierarchy of concepts and generalizations. The technological component of information technology through its capacity to store, speed up, present, and record has extended the competencies of the teacher or communicator and made them widely available.

A crucial question is: Why should a teacher be interested in information technology? There are many good reasons. First of all, the teacher must be interested in it because we are living in a world of information industries and universal information consumption. We are in the midst of the communication revolution, and the nation's schools must respond to the social, economic and cultural realities of life.

There is a much more important reason: the fact that a large part of education involves information transmission. Some educators refuse to concede this important fact. They do sometimes agree that the cognitive components of teaching-learning are informational, but they fail to realize that attitudes, values, and social adjustment are also built on cognitions and involve information handling. We have said, then, that the total educational enterprise--the education of the whole child, his cognitions, attitudes, values, social adjustments--involves more or less information-handling, and the teacher should then be interested in information technology and in the information media and tools that it has made available. He must be proficient in adapting the information technology into an education technology and use it in the classroom for achieving his instructional objectives. Asteroids TEACH TECH 1, 7, and especially 11 the theme of which is "The Teacher of Tomorrow" should be especially useful at this point.

We should lay to rest here another misconception about the use of educational technology. It is not suggested that educational technology or its products can or will completely take over from the teacher. It is said, however, that the teacher can use educational technology to fulfill his objectives; that the teacher can be in control, and the products of technology can be his servants and slaves. It is important, however, for the teacher to understand with considerable sophistication the instructional technology, instructional systems and educational media if he is to use them wisely and well, and not be swamped by them.

The place and role of technology and media in instructional situations may be seen as emerging from an inter-action of the information content and the method of communicating that content. Instructional technology may provide only part of the answer in one particular instructional situation or may take over completely a particular function or routine in another instructional setting.

Here is another way of looking at the interrelationships between the teacher and technology:

Teaching = (Teacher x Instructional Technology)

Some interesting conclusions can be drawn from the above statement through simple logic. One, if the teacher withdrew completely from the school, and the teacher factor thus assumed the value of zero, instructional technology would collapse and teaching as we know it would disappear. The place of the teacher in education is thus dramatically brought home by this operation.

On the other hand, the resulting teaching may be considerably enhanced by use of instructional technology not only where the teacher is inexperienced or simply not too competent, but also where the work of the skillful teacher can be amplified by technological extensions of his work. And since retraining and equalization of expertise of millions of teachers is almost impossible, the equalization of teaching (and learning) excellence through teaching materials or instructional technology makes a lot of sense. Finally, we must face the fact that there will never be enough really good teachers to fill the growing needs of education. In some cases, there may be no teacher at all. Most of these points are highlighted in the Planetary film, The Teacher and Technology.

Media Create Curriculum

It is customary to talk of educational media (the products of educational technology) as vehicles or carriers of curriculum. That is, in fact, their primary function.

It should be recognized, however, that the media also have created curriculum, in the sense that media have made it possible for teachers to teach ideas and skills that would have been impossible to include in the curriculum before the coming of instructional technology. An analysis of the elementary and secondary school curricula reveals a long list of topics and activities which have been made possible by the media. And what media has enriched is the total curriculum. The Asteroid sequence TEACH TECH 7 is especially useful here.

In the preceding section, we have related communication to its foundations with perception and learning. We have discussed some theoretical models for looking at the act or event of communication and for making it more understandable and more effective. We have placed "Communication as Method" in historical perspective, pointing out how our tools of communication have been sharpened and extended over the years leading to the present-day communication revolution. It was also pointed out that the communication revolution is as much psychological as technological. We indicated briefly why instructional technology should be understood and used by the teacher to make his curriculum come alive for his learners.

Communication as Social Fact

The communication revolution is so widespread and all-pervasive that it touches the life of every single individual in the world today, directly or indirectly. In a culture like that of the United States the manifestations of this revolution are dramatically obvious--160 million radio sets, over 60 million television sets, more than 90% of the people within reach of television, television viewing approximately three hours per day per person. Communication is one of the most widely consumed utilities. It is the most important part of the social environment in which we live. It is like the air we breathe; a social fact of the first importance. This is the primary concern of the Planetary film, The Information Explosion.

The implications of a phenomenon of this magnitude have been many--some obvious and often discussed, others not so obvious, but equally important. Consider, for instance, the questions raised by McLuhan in in the Satellite film, The Communication Revolution. He talks of the impact of the new pictorial media of film and television on a world dominated by print with effects on our basic patterns and modes of structuring reality and coping with the world around. This is how the communication revolution comes to be a partner in the "psycho-biological" evolution of man.

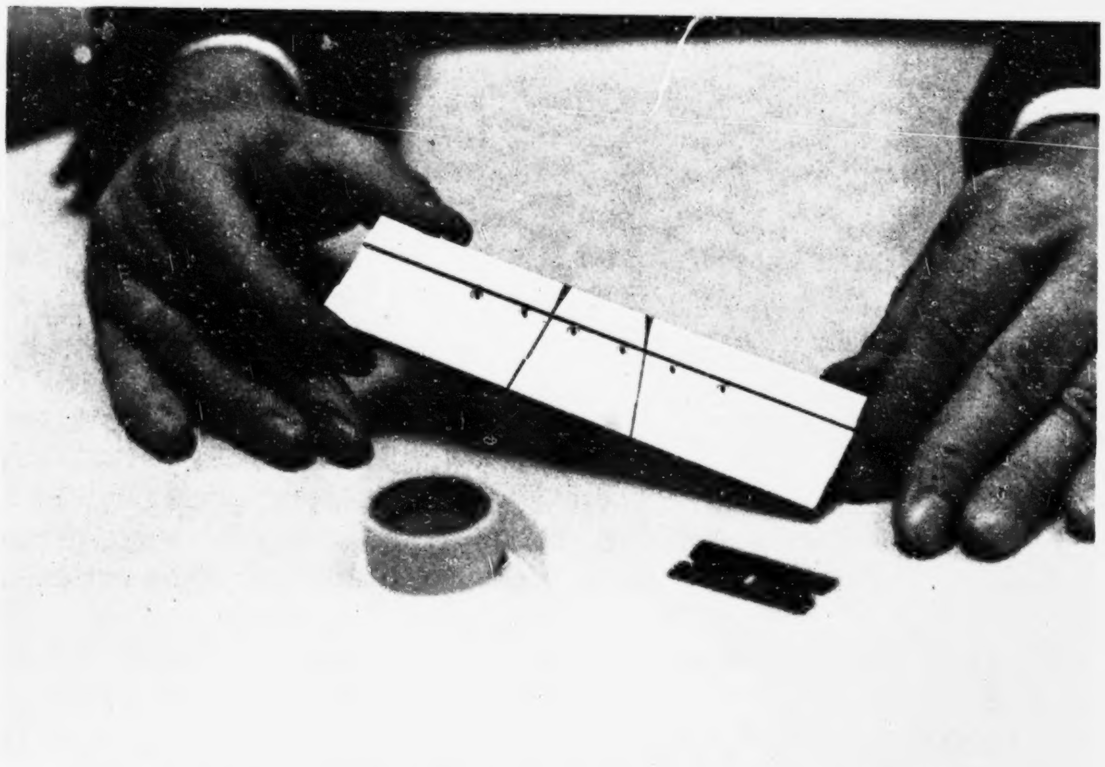
Another sociological implication of communications revolution is the fear of some philosophers and thinkers that the products of this revolution in the form of mass media are creating a mass culture of conforming people who are becoming more and more similar and vulnerable to centralized control and manipulation. It should be obvious that this sociological implication is worth discussing in a society with democratic value orientation. The implications for "The School of Tomorrow" found in Asteroids TEACH TECH 11 and INFO EXPL 1 and 6, should make these segments especially useful in such discussion.

When parent-teacher groups, women leagues, and religious leaders discuss television content and hold it at least partly responsible for rise in delinquency or violence on the streets, they are again discussing communication as a social fact. So are the educators who point up the educational opportunities provided by television at its best resulting in a truly basic equality through sharing of information and culture that was for long available exclusively to the aristocracy.

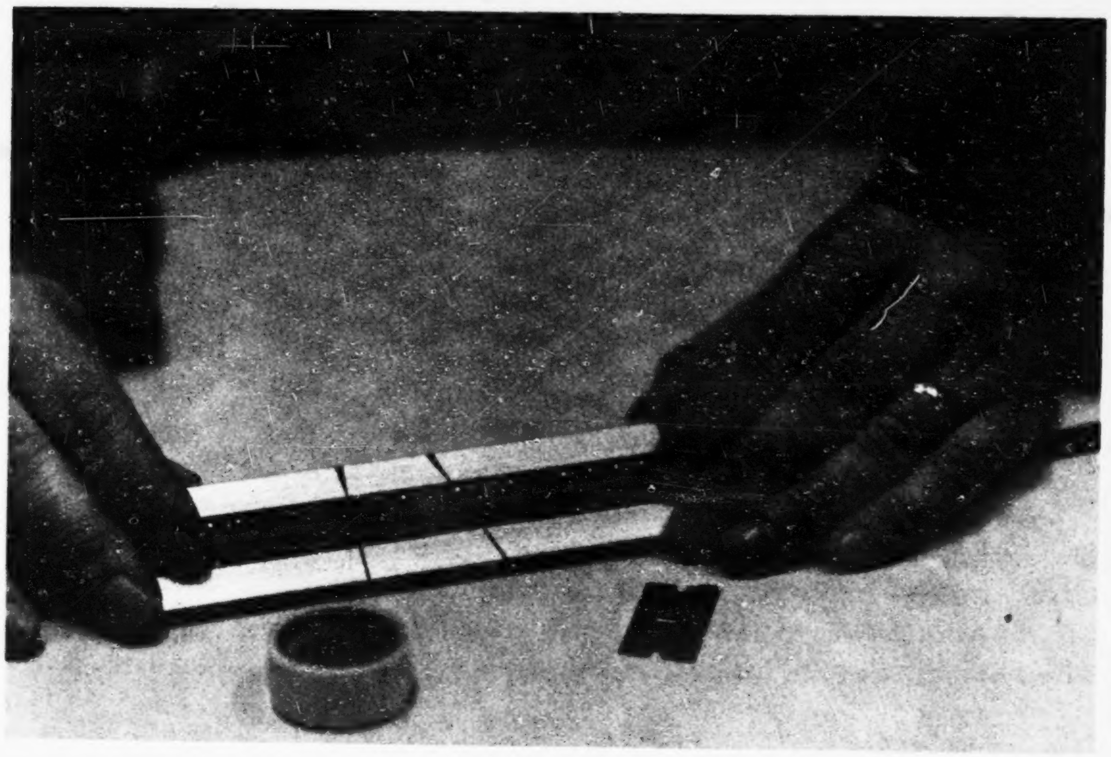
As pointed out often in this monograph, the three faces of communication belong to the same entity. The methods and tools of communication are used within particular value systems, the sociological impacts of communication are discussed in terms of social fact in terms of what they are doing or threaten to do to our social life and political institutions.

The three pier model of communication--as value, method, and social fact, should help to analyze communication processes. It should also help to relate different concepts in communication, education and democratic living in mutually explanatory patterns. And, finally, it should suggest further modes of use for the repertoire of examples, models, and visual and verbal reportage found in the Galaxy of Film Documents on Communication Theory and the New Educational Media described in this Manual and Final Report to the U.S. Office of Education.

APPENDIX A



Above: The equipment for tape-splicing Asteroid segments: splicing block; perforated 16mm tape; and a razor blade. Below: The film is cut either at right angles or on the diagonal. The tape is slipped over pins and adheres to film. Film may be spliced without loss of frame.



APPENDIX B-1

In the pre-production stage of this project, four short test or "cue" films, summarizing and symbolizing the theme of each of the basic films were produced as stimulus material to find out: 1) to what extent teachers in training could relate each of the four major topics to classroom practice, 2) what their attitude was towards the so-called "new" media of education, and 3) reactions to specific production techniques which might provide useful cues to the final treatment of each subject.

The test audience consisted of a total of 719 students enrolled in education courses in thirteen colleges and universities during the summer session of 1964. Field representatives, known to the investigators to be reliable and perceptive, conducted the tests.

All four films were shown to subject groups at one sitting. The showing was interrupted after each segment to allow respondents to write down as many applications of each topic to classroom practice as they could think of during a ten-minute period. The next segment was then immediately shown, again followed by a writing period, and so on.

The dependent variable was the number of applications of theory to practice which subjects could produce for each of the films, as well as for the combination of films. Independent variables, in terms of which the dependent variable could be analyzed included: 1) participating university, 2) sex, 3) age, 4) position (principal, teacher, etc.), 5) grade level taught, 6) years of experience, 7) years of training beyond high school, 8) number of different kinds of visual aids which the subject had used, 9) number of special training experiences in which the subject had participated, 10) score on a test of general attitude towards the new media, 11) order in which the test films were shown, whether from most to least specific, or vice versa, and 12) order in which the attitude scale was administered, whether preceding or following the showing of the film.

The test films were deliberately ambiguous in design in an effort to "cue" the perceptive backgrounds of the intended audience and obtain an idea of their ability to relate the themes of the major films to classroom practice. The overall results of this test, while not always statistically reliable, are interesting and suggestive of use patterns.

For example, the order in which the short test films were shown _did_ seem to have a clear effect. Subjects seeing the most specific film first (_The Teacher and Technology_ followed by _Perception_, _The Process of Communication_, and _The Information Explosion_) suggested more implications for classroom practice than the groups viewing the films in the reverse order which produced only 72 percent as many implications.

The test group was, as a whole, favorably inclined towards the new media as measured by the "New Education Media Attitude Scale" (NEMA) which had been developed in connection with an MPATI study. The mean score for the 538 subjects who completed the test was 60.74, almost a half standard deviation below the mean score of 67.14 obtained for MPATI subjects, reflecting a more favorable attitude towards media than the subjects responding to the airborne television test a year earlier.

Based on demographic data, it seemed probable that females saw more classroom applications of the concepts than males.

Principals found more applications than teachers or students (although the small numbers of principals and supervisors included in the sample make these findings highly tentative).

Older teachers saw fewer applications than younger teachers.

The grade-level taught seemed to bear little relationship to the number of suggested applications.

Persons with less teaching experience seemed to see fewer applications than persons with more experience.

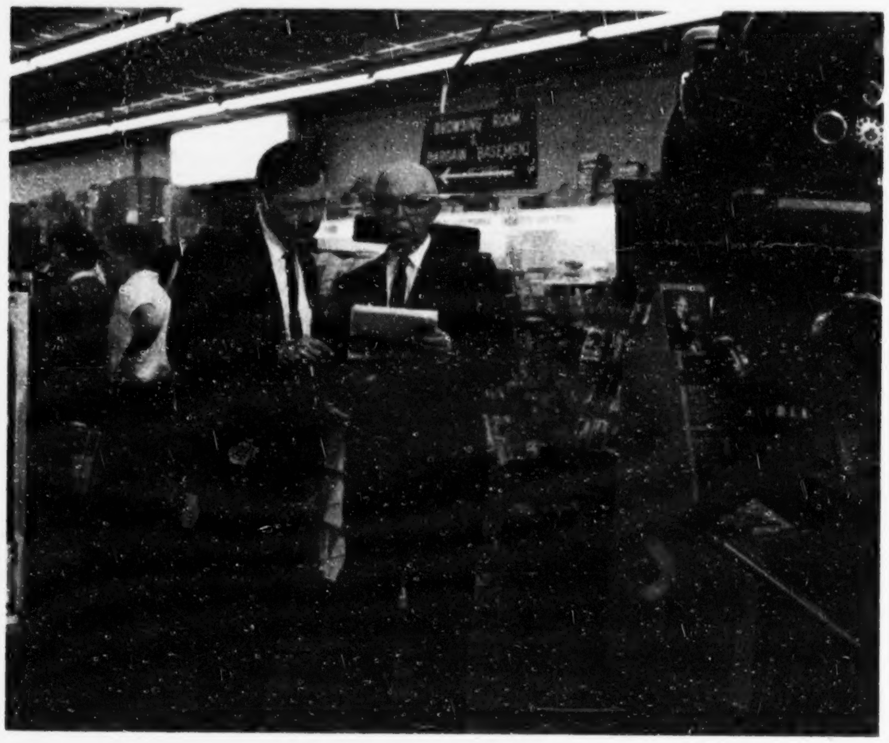
The number of years of training, special workshop experience, or experience with visual materials seemed to bear little or no relation to the number of applications made. Creativity and imagination may be as important in this field as training or even experience. All of these variables suggest dimensions for further study and consideration in terms of effective usage.

APPENDIX C

Above: Dr. Kenneth Norberg relates theory to classroom practice in "Perception and Communication." Below: Dr. George Gerbner (right) discusses script for "The Theory of Communication" with Producer Robert W. Wagner.

APPENDIX D

Above: Dr. James D. Finn (seated) outlines the history of instructional technology in film, "The Teacher and Technology". Below: Dr. Edgar Dale (right) and Director Carl V. Clausen during shooting of "The Information Explosion".


BROWSING ROOM
&
BARGAIN BASEMENT